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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/667,368 | 09/23/2003 | Takafumi Noguchi | Q75436 | 9196 |
| 23373 | 7590 | 06/24/2005 | EXAMINER | |
| SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037 | | | CHOI, JACOB Y | |
| | | ART UNIT | PAPER NUMBER | |
| | | 2875 | | |

DATE MAILED: 06/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | |
|------------------------------|-----------------|-------------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 10/667,368 | NOGUCHI, TAKAFUMI |
| | Examiner | Art Unit |
| | Jacob Y. Choi | 2875 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 07 February 2004.

2a) This action is FINAL. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-10 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 1-10 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on 23 September 2003 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some * c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

| | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>1/7/2004</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-8 are rejected under 35 U.S.C. 102(e) as being anticipated by Ishihara et al. (US 2003/0048072).

Regarding claim 1, Ishihara et al. discloses a light-emitting portion having a higher refractive index than a refractive index of air [0007, 0021, 0022], and a diffraction grating structure [0059] provided to a light-emitting side surface of the light-emitting portion, wherein a minimum light-emission value is equal to or less than 50 % of a

maximum light-emission value [0060] when white light is emitted from the light-emitting portion.

Note: claims in a pending application should be given their broadest reasonable interpretation. *In re Pearson*, 181 USPQ 641 (CCPA 1974).

Regarding claim 2, Ishihara et al. discloses a color separation filter [0029, 0117, 0120] provided between the light-emitting portion and the light-emitting side surface, wherein a minimum value of a spectral product obtained from a light-emission waveform of the white light emitted from the light-emitting portion and a spectral transmittance of the color-separation filter is equal to or less than 50 % of a maximum value thereof, whereby the minimum light-emission value is equal to or less than 50 % of the maximum light-emission value when the white light is emitted from the light emitting portion.

Regarding claim 3, Ishihara et al. discloses a color-separation filter which has minimum transmittance of equal to or less than 50 % of maximum transmittance is used for the color-separation filter [0029, 0117, 0120 & 0060].

Regarding claim 4, Ishihara et al. discloses the light-emitting portion includes light-emitting materials for at least two primary colors (R, G, B) capable of emitting the white light among light-emitting materials for three primary colors [0029, 0117, 0120].

Note: it has been held that the recitation that an element is "capable of" performing a function is not a positive limitation but only requires the ability to so

perform. It does not constitute a limitation in any patentable sense. *In re Hutchison*, 69 USPQ 138.

Regarding claim 5, Ishihara et al. discloses a light-emission ratio of the light-emitting materials for the at least two primary colors among the light-emitting materials for the three primary colors is adjusted to make the minimum light-emission colors is adjusted to make the minimum light-emission value equal to or less than 50 % of the maximum light-emission value when the white light is emitted form the light-emitting portion [0029, 0117, 0120 & 0060].

Regarding claim 6, Ishihara et al. discloses the light-emitting portion includes the light-emitting materials for the three primary colors [0029, 0117, 0120].

Regarding claim 7, Ishihara et al. discloses the light-emitting materials exhibit light emission by singlet exciton [0006, 0059].

Regarding claim 8, Ishihara et al. discloses the light-emitting materials exhibit light emission by triplet exciton [0006, 0059].

4. Claims 1-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Shirasaki et al. (USPN 6,025,894).

Regarding claim 1, Shirasaki et al. discloses a light-emitting portion having a higher refractive index than a refractive index of air [53, 55, 159, 165, 175, 180-182, 194, 202, 217, 229], and a diffraction grating structure (120) provided to a light-emitting side surface of the light-emitting portion, wherein a minimum light-emission value is

equal to or less than 50 % of a maximum light-emission value when white light is emitted from the light-emitting portion.

Regarding claim 2, Shirasaki et al. discloses a color separation filter [39, 40, 87, 116, 129, 148, 246] provided between the light-emitting portion and the light-emitting side surface, wherein a minimum value of a spectral product obtained from a light-emission waveform of the white light emitted from the light-emitting portion and a spectral transmittance of the color-separation filter is equal to or less than 50 % of a maximum value thereof, whereby the minimum light-emission value is equal to or less than 50 % of the maximum light-emission value when the white light is emitted from the light emitting portion.

Regarding claim 3, Shirasaki et al. discloses a color-separation filter [39, 40, 87, 116, 129, 148, 246], which has minimum transmittance of equal to or less than 50 % of maximum transmittance is used for the color-separation filter.

Regarding claim 4, Shirasaki et al. discloses the light-emitting portion includes light-emitting materials for at least two primary colors capable of emitting the white light among light-emitting materials for three primary colors [39, 40, 87, 116, 129, 148, 246].

Regarding claim 5, Shirasaki et al. discloses a light-emission ratio of the light-emitting materials for the at least two primary colors among the light-emitting materials for the three primary colors is adjusted to make the minimum light-emission colors is adjusted to make the minimum light-emission value equal to or less than 50 % of the maximum light-emission value when the white light is emitted form the light-emitting portion.

Regarding claim 6, Shirasaki et al. discloses the light-emitting portion includes the light-emitting materials for the three primary colors.

Regarding claim 7, Shirasaki et al. discloses the light-emitting materials exhibit light emission by singlet exciton [30, 176, 177].

Regarding claim 8, Shirasaki et al. discloses the light-emitting materials exhibit light emission by triplet exciton [30, 176, 177].

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobori (USPN 6,327,554) in view of ODA et al. (US 2002/0180348).

Regarding claim 1, Kobori discloses a light-emitting portion having a higher refractive index than a refractive index of air [7, 8], wherein a minimum light-emission value is equal to or less than 50 % of a maximum light-emission value when white light is emitted from the light-emitting portion.

Kobori failed to disclose the details of a diffraction grating structure provided to a light-emitting side surface of the light-emitting portion.

ODA et al. teaches a diffraction grating formed as a constituent element on the organic electroluminescent device.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify teachings of Kobori with a diffraction grating element of ODA et al. to improve the light extraction efficiency of the device and its viewing angle(s), also it is preferable for the grating structure with less internal reflection by adjusting the index of refraction in order to prevent light emitted from the organic EL being reflected at the grating structure and traveling backward.

Regarding claim 2, Kobori discloses in view of ODA et al. discloses the claimed invention, explained above. In addition, Kobori discloses a color separation filter [71-74] provided between the light-emitting portion and the light-emitting side surface, wherein a minimum value of a spectral product obtained from a light-emission waveform of the white light emitted from the light-emitting portion and a spectral transmittance of the color-separation filter is equal to or less than 50 % of a maximum value (*at least 50 % in a wavelength region of 300 to 700 nm*) thereof, whereby the minimum light-emission value is equal to or less than 50 % of the maximum light-emission value when the white light is emitted from the light emitting portion.

Regarding claim 3, Kobori discloses in view of ODA et al. discloses the claimed invention, explained above. In addition, Kobori discloses a color-separation filter [71-74], which has minimum transmittance of equal to or less than 50 % of maximum transmittance is used for the color-separation filter.

Regarding claim 4, Kobori discloses in view of ODA et al. discloses the claimed invention, explained above. In addition, Kobori discloses the light-emitting portion

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includes light-emitting materials for at least two primary colors capable of emitting the white light among light-emitting materials for three primary colors.

Regarding claim 5, Kobori discloses in view of ODA et al. discloses the claimed invention, explained above. In addition, Kobori discloses a light-emission ratio of the light-emitting materials for the at least two primary colors among the light-emitting materials for the three primary colors is adjusted to make the minimum light-emission colors is adjusted to make the minimum light-emission value equal to or less than 50 % of the maximum light-emission value when the white light is emitted form the light-emitting portion.

Regarding claim 6, Kobori discloses in view of ODA et al. discloses the claimed invention, explained above. In addition, Kobori discloses the light-emitting portion includes the light-emitting materials for the three primary colors.

Regarding claim 7, Kobori discloses in view of ODA et al. discloses the claimed invention, explained above. In addition, Kobori discloses the light-emitting materials exhibit light emission by singlet exciton [47].

Regarding claim 8, Kobori discloses in view of ODA et al. discloses the claimed invention, explained above. In addition, Kobori discloses the light-emitting materials exhibit light emission by triplet exciton [47].

Regarding claims 9 and 10, Kobori in view of ODA et al. discloses the claimed invention, explained above. In addition, ODA et al. discloses the diffraction grating structure has a pitch of a fine convex-concave structure being in various range in μm .

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ODA et al. fails to specify the workable range of the diffraction grating structure, such as a pitch of 1 μm to 4 μm and a depth of 0.4 μm to 4 μm .

It would have been obvious to one having ordinary skill in the art at the time the invention was made to optimize the workable range of the diffusion grating to improve the light extraction efficiency of the device, also it is preferable for the grating structure with less internal reflection by adjusting the index of refraction in order to prevent light emitted from the organic EL being reflected at the grating structure and traveling backward, and since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

7. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishihara et al. (US 2003/0048072).

Regarding claims 9 and 10, Ishihara et al. discloses the diffraction grating structure has a pitch of a fine convex-concave structure being in various range in μm .

Ishihara et al. fails to specify the workable range of the diffraction grating structure, such as a pitch of 1 μm to 4 μm and a depth of 0.4 μm to 4 μm .

It would have been obvious to one having ordinary skill in the art at the time the invention was made to optimize the workable range of the diffusion grating to improve the light extraction efficiency of the device, also it is preferable for the grating structure with less internal reflection by adjusting the index of refraction in order to prevent light emitted from the organic EL being reflected at the grating structure and traveling

backward, and since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

8. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirasaki et al. (USPN 6,025,894).

Regarding claims 9 and 10, Shirasaki et al. discloses the diffraction grating structure has a various range in μm .

Shirasaki et al. fails to specify the workable range of the diffraction grating structure, such as a pitch of 1 μm to 4 μm and a depth of 0.4 μm to 4 μm .

It would have been obvious to one having ordinary skill in the art at the time the invention was made to optimize the workable range of the diffusion grating to improve the light extraction efficiency of the device, also it is preferable for the grating structure with less internal reflection by adjusting the index of refraction in order to prevent light emitted from the organic EL being reflected at the grating structure and traveling backward, and since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kita et al. (USPN 6,903,506) – organic electroluminescent element, displaying apparatus, light emitting method, displaying method and transparent substrate

Seo et al. (US 2002/0113546) – organic light emitting device and display device using the same

Seo et al. (US 2002/0121860) – light emitting device and method of manufacturing the same

Leising et al. (USPN 6,117,529) – organic electroluminescence devices and displays

Maeda (USPN 6,873,099) – EL device, EL display, EL illumination apparatus, liquid crystal apparatus using the EL illumination apparatus and electronic apparatus

Sekiguchi (US 2002/0054261) – liquid crystal display device

Smith et al. (US 2004/0263045) – optoelectronic displays

Itou et al. (USPN 6,556,260) – liquid crystal display apparatus

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jacob Y. Choi whose telephone number is (571) 272-2367. The examiner can normally be reached on Monday-Friday (10:00-7:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on (571) 272-2378. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JC



JOHN ANTHONY WARD
PRIMARY EXAMINER